LOUD SPEAKER WITH SET IS BOON TO RADIOPHONE FAMILY

HORN PERMITS ENTIRE FAMILY TO LISTEN IN

Construction of Instrument to Throw Radio in Room Easily Accomplished by Novice—Numerous Devices on Market.

By Fred Kosslow.

There is a startling array of horns for radiophone work. They range in style, shape, price and elaborate attractiveness in a bewildering way. Out of the almost incalculable number of such affairs some half dozen are worth looking into. Roughly, they are divided into two classes, viz, those which amplify by their mere acoustical properties and freak twists of metal tubing and those which make use of tubes or magnetic fields.

The last two are really the only ones worth purchasing for the simple reason that the acoustical loud speaker is easily made at home with but few spare parts. Before going into the details of construction of this type, however, it might be well to call attention to the serious loud speaker, such as those employing the step-up coil or induction coil with an arrangement consisting of two coils of wire, a rotor and a stator, the latter energized and the former depending for its current on the fluctuating currents set up by the incoming signals.

Ampliformer Used.

This type of loud speaker is generally used in conjunction with a special set of two or three amplifying tubes, usually of the five-watt variety, or, in the case of the latest and, in the opinion of the author, the best, model, three repeater tubes, such as used to amplify long-distance telephone signals.

The incoming signal taken from the detector or two-step amplifier output of the receiving set is led into this special transformer, passes through one, two or three tubes and reaches the loud speaker proper. It is then stepped up by a small transformer and led into the two coils mentioned which act as a sort of galvanometer, magnifying the sounds to many degrees.

The usual practice employs for the horn proper, a phonograph effect made of tin or sheet metal. That this produces an uncomfortably tinny sound has not yet occurred to the makers of the now most popular horn. However, there appeared in Richmond several days ago one of the new variety, made by a well-known electrical company, which is constructed of some sort of composition that eliminates this artificial tone. This type employs what is technically known as the Baldwin phone, made similar to the two-coil arrangement at the base of the loud speaker described.

This is the kind of attachment used in the large cabinet type radiotrolas now being sold. It is said to produce the maximum amplification with a minimum loss of tone quality and considerable reduction in static or interference. The thing to guard against is the construction of the horn. The engineer is the only one who can use the queer shapes seen in this loud speaker; the novice should be satisfied with the straight megaphone, coupled to the regular receiver with a rubber connection or something that will absorb the shock transmitted by floor or room vibrations.

One of the best loud speakers which the novice may construct is made by taking the Baldwin phone attached either to a megaphone or a ready-made horn and placing a wooden chopping bowl directly in front of it, allowing about two or three inches space between the face or horn opening and the center of the bowl. This latter is simply a hollow hemisphere of wood. The fastening may be done with small angle irons or strips and the bowl should be so placed on the horn as to allow a stand to hold the entire arrangement. Shellacking the bowl will make a neat loud speaker.

Good Results Possible.

These amplifiers are really efficient when used carefully. The distortion usually reported generally comes from an immoderate use of power, too great a filament brilliancy, or too much regeneration. If an operator understands the use of the two instruments, the results obtained will be more than expected. Both power loud speakers now on the market require very little adjustment and, were it not for the high plate voltage used, they should cost but little to operate.

Coming down the line in cost to a very popular type of loud speaker and, perhaps, the best for the ordinary home, the Baldwin type phone, attached to some sort of nonmetallic horn, will suit the need of nearly every one. This type of phone is now made with ferrule for attaching the megaphone or whatever is used and arranging the loud speaker is an easy matter.

Dozens of different ways are being commercialized by loud-speaking manufacturers for employing the ordinary head set or single 2,000-ohm receiver as a loud speaker. The simplest arrangement may be duplicated by making a cardboard horn some ten inches long, with small end fitting snugly on the single receiver with the aid of some sealing wax. This will act as a resonant amplifier for most radio signals. Another method, using both receivers, is to take a cardboard tube six inches long, insert the megaphone in a hole in the center and cap the headset on the ends of the tube. The tension of the headset keeps the phones in place. This is one of the best and easiest methods known.

Another Method.

Still another trick—provided the rest of the family doesn't want to dance—is to take the reproducer off the family phonograph and place either the Baldwin phone with its attachment, or another phone with home-made attachment, on the phonograph arm. This utilizes the sound chamber of the phonograph with no injury to the musical instrument.

Making the loud speaker should give full play to the ingenuity of the individual novice. Remember always that the purchase of such an instrument should be made with caution and preferably the advice of a radio friend. It is well to bear in mind also that unless the signals are received sufficiently loud and clear no amount of external apparatus will aid. A loud speaker does not amplify signals which cannot be heard in the ordinary receiver. On the contrary, some signals will be heard in the phone which cannot be put on even the most expensive loud speaker and be heard.

Static Not Wholly Fault of Bad Summer Signals

Don't blame all trouble on static, especially if the weather is fair. With humidity low and the temperature cool, static interference is usually at a minimum. If results are unsatisfactory in spite of good weather conditions look for some other kind of interference.

Sometimes when an aerial has been lined up parallel to a near-by telephone, power or telegraph line, trouble is caused. The close proximity to these lines will reduce the efficiency of the aerial. Crossed wires and poor connections in the receiving set will impair the effectiveness of the apparatus. If a little time is taken when installing these sets there will be more satisfactory results obtained from them.

MOVIE BROADCAST IS PRESENT POSSIBILITY

Invention Recently Announced at Boston Radio Show Ready for Use.

FIELD IS UNLIMITED ONE

Special Lens, Developed by Francis C. Jenkins, Makes Transmission of Stills, Movies and Light Signals Matter of Present.

Transmission of pictures by radio will be accomplished within the next few months, it has been announced by a Washington expert. Not only will this make possible the sending of one photograph across the ocean, but the projection of actual moving pictures or even the reflection of the countenance in a mirror, it is said.

These Aladdin-like statements come from no less an authority than C. Francis Jenkins, who recently announced his inventions at the Boston radio show, creating a sensation among scientists present at the exhibit. Mr. Jenkins believes he has solved every element in the problem of projecting pictures by radio with the laboratory machine upon which his experiments have been made, and that the further process of commercializing his invention is a comparatively simple one.

Motion-Picture Expert.

"My entry into the radio field came through my close association with the motion-picture field for the last twenty-five years," Mr. Jenkins said. "My first contribution to the motion-picture industry was a motion-picture machine publicly exhibited in 1894, and now on exhibit in the National Museum.

"The new machine for the transmission of pictures by wireless is the result of the development of ideas I have had in mind for several years, but which I was never able to work out until I hit upon a new invention and the development of optical glass by which it is now possible to take as high as 1,600 pictures per second. Instead of the intermittent projection it is now possible to have one which is practically continuous. The principle is very much the same in comparison with the old steam engine and the turbine.

"In our laboratory experiments, which were highly successful, the apparatus used consisted of the ordinary radio sending and receiving set. The sending set consisted of a pair of prismatic rings of optical glass and a highly sensitive photo-electrical cell. This cell gives current values in proportion to light values.

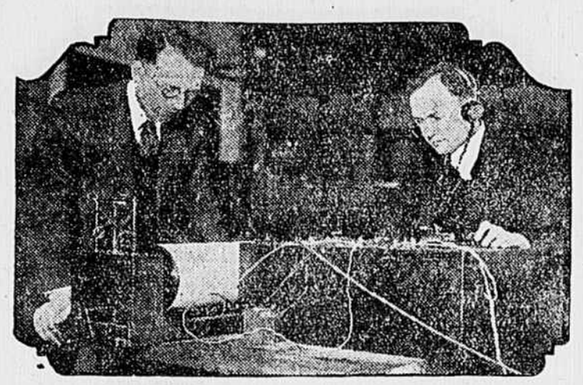
Description of Transmitter.

"The set which receives the impressions from the sending set consists of a similar group of prismatic rings and a simple light value so synchronized with the sending set as to record its impressions exactly. It is comparatively easy to record black and white, and I am sure that when the machine is further adjusted and speeded up over shades of color will be reproduced."

The practical application of the Jenkins invention is just beginning to be revealed. It is expected that it will enable moving-picture houses to project on their screens a picture broadcast from a central station, thereby relieving the necessity for exchanges and the expense of sending the picture to more than a few points. Likewise, the introduction of the broadcast movie into the private home would work miracles in recreational realms.

The relaying of the picture of a criminal by the police departments would prove an excellent means of apprehension. Numbers of other applications of the remarkable invention are being worked out by Mr. Jenkins.

RADIO RELAY RECORDER FOR VARIED SERVICE PERFECTED



Dr. E. A. Eckhardt and Dr. J. C. Karcher, of the Bureau of Standards, testing the radio recorder developed there.

WASHINGTON, June 3.—Experts of the United States Bureau of Standards announce the perfection of another radio device in their laboratories.

It is the radio relay recorder.

Use of this instrument, it is maintained, would mean the elimination of an experienced radio operator, accuracy in receiving signals, operation of another moving body by radio, reception of two messages simultaneously and reduction of atmospheric interference.

Sturdiness.

According to the description by F. W. Dunmore, of the Bureau of Standards, the new recorder is the result of a search for a more rugged and powerful device than those in existence. For its operation, currents of five milliamperes or more are used and the feebie radio signals received are amplified by an electron tube amplifier.

"With a current of five milliamperes or more available," writes Dunmore, "it is possible to use an ordinary telegraph relay, which possesses rugged construction and does not require careful and repeated adjustment."

This relay is so constructed that the electron tubes may take their power from an ordinary home electric lighting wire.

Applications.

Among the applications to which the instrument may be put, says Dunmore, are:

"1. Code messages, news, market and weather reports may be received on tape at fairly high speed and read off by an operator of comparatively little experience.

"2. A call system may be used, thus avoiding the necessity of a constant watch by an operator.

"3. In line-radio telegraphy a sounder may be operated from the signal transmitted by radio-frequency currents, so the operator may not read signals received on the telephone receiver.

"4. The relay can be used for controlling an automobile, boat or airplane.

"5. Two recorders in series can receive two messages on the same antenna at the same time.

"6. Atmospheric interference is somewhat reduced."

KNOW RADIO SET, IS ADVICE TO FAN

Radio Official Advocates Thorough Acquaintance With Various Phases of Game.

[By United News.]

WASHINGTON, June 3.—Government officials now see the radio "landslide" stabilizing itself so far as supply and demand of apparatus go. But with this stabilization, they contend, manufacturers and retailers are more than ever obligated to educate their customers in the new art.

One of the leading radio apparatus makers in the country recently told the United News that his company's greatest problem today is not that of fulfilling the demand for radio sets, but of "keeping the radio fan sold."

And the Department of Commerce would second this idea and suggest in its official capacity that not only should the manufacturer keep the fan "sold" but the fan should keep himself "sold."

The solution of the problem, it is said, is practically the same for both manufacturer or retailer and radio fan. In brief, this is the solution as a prominent radio official sees it:

1. Know your radio area; that is know the location of the nearest broadcasting station.

2. Know the sending capacity of that station and buy your set accordingly, so that, static and fading taken into consideration, you can obtain uniform service all the year round.

3. Know the receiving capacity of your set, whether it is a crystal detector or a vacuum tube detector outfit.

4. Know all about your set so that you can repair it yourself. This knowledge will save you money and will also give you more confidence in radio telephony.

The solution as applied to manufacturers or retailers is simply making possible through educational helps these four steps. The similarity between radio dealer service and automobile dealer service is marked, government officials point out.

"Know where the trouble is and then fix it," they declare, is advice that applies to automobiles and radio apparatus equally well. Today, the automobile owner doesn't return his car just because a spark plug is burnt out, although many a radio fan returns his set in great disgust if a connection wiggles loose.

Standardization of parts, just as in the automobile industry, is now held a probability before long. The allocation of broadcasting stations so as to take care of less congested areas will follow the enactment of the new radio law. Production and distribution of radio apparatus will probably follow stable lines next winter. But none of these signs of progress can be translated into permanent successes, officials insist, until the radio fans know more about radio.

Princeton's Radio Destroyed.

A disastrous fire in one of the buildings of the Princeton University recently destroyed a part of the radio equipment. While the loss was amply covered by insurance, it was an unfortunate accident since the matter of arranging for broadcasting service had just about been completed. The idea of broadcasting service originated with L. S. Gatter (1912) and was taken up at once by those in charge of the station. The University of Wisconsin and that of Minnesota already have established broadcasting stations for general university news, as well as for results of athletic contests.

"FESTIVAL OF HAMS" IS SET FOR MONDAY

First Social Event of Otherwise Serious Amateurs Bodes Well for Radio.

Throwing "wavelengths," "couplers," "vacuum tubes," and other nonsense to the winds for several brief hours of frolic, the members of the Tri-County Radio Club, the largest organization of its kind in the State, will go out into the "sticks" of Westhampton tomorrow night for the first social event staged by the amateurs since the organization of the club.

The affair has been planned with an elaborate carefulness that smacks of something far superior to the ordinary "party." It is even reputed that the radio waves, which will undoubtedly be in evidence, will not be undampted. The event will be held at the home of John B. Swartwout, of Stop 27, Westhampton, and several novel stunts will be "pulled off."

Of course a radio set will be in operation, and the program from WBAZ will be given especially for the party. Since it is planned to hold the meeting on the lawn, a very large loud speaker will be arranged to throw the program from The Dispatch broadcaster all over the lawn. In addition to this program the amateurs will listen in on KDKA and others.

Only members in good standing will be admitted to the party, it is said. Each member may bring one friend.

Parisians "Lift" Receivers.

Opening of the broadcast from Eiffel Tower brought much joy to the Continent and England, but not to the French Government. In Paris alone it was reported that more than 200 telephone receivers were "lifted" every day and never returned. The radio fans are blamed.

Caution to Radiofans.

Remember that seventy-five ohm receivers, as are used in ordinary telephone work, are entirely unsuited to radio work. Of course, some will work under certain conditions, but most of them will not. Get a pair of 2,00 or more ohm headphones.

Automatic S O S Signal Is New Radio Invention

Interesting progress has been made in England in the way of developing an automatic device for sending out S O S or distress signals at sea. Instead of using the usual telegraph key and sending out the S O S call, the system is to send out by means of an automatic device a dash of a certain length at regular intervals. Such signals serve to operate an alarm bell on other ships within range, and the operator of the ship in distress can then send specific instructions. The important advantage of the new system is that its signals do not conflict with other radio signals, and that it rings an alarm bell on ships in the immediate vicinity. Ten ships are already equipped with the new signaling device and twenty-five more are being so equipped. Satisfactory results have been obtained over a radius of 100 miles.

WBAZ IS MECCA OF STATE RADIO FANS

Big Broadcast Station of Dispatch Papers Has Numerous Visitors.

ODD HAPPENINGS OFTEN

Experience of Talking Over Radio Broadcaster Finds Numbers of Speakers and Performers, Otherwise Unabashed, Quaking.

By the Radio Editor.

Since the very day that the designer of WBAZ obtained the keys to the two rooms on the tenth floor of The Dispatch Building, rode up and unlocked the doors, a steady and unceasing stream of visitors from everywhere has been dropping in.

They range in size from the tiniest and most sophisticated "squeak box rattler," as the "ham" is known, to the tall, meek-looking gentleman with the apologetic air, who is probably a radio engineer. Invariably they assume a much-surprised air and make interesting comments.

Last Monday we had a call from an interesting young lady. Just the sort of visit we appreciate. She wore an exceedingly severe air that became her not. An air of savoir-faire pervaded her personality. Her companion, not she, was the inquisitive one; she pointed to the familiar little dial marked "tickler" and asked its function. "Aw!" said the lady of the placid countenance, "that's when he has funny stuff." What can we do, I ask!

The studio room between 7:45 o'clock and 9 is most interesting. A big megaphone is the instrument used to pick up the sounds to be broadcast. Each speaker has to be placed in exactly the right position, while an operator in the transmitting rooms keeps alertly at the phones and warns the studio attendant whenever anything goes wrong, such as when one instrument in an orchestra is heard too loud or soft, etc. Sometimes one piece in an orchestra is moved a dozen times before it is allowed to go out over the radio.

The attendant in the studio room is warned by a light when the transmitter is working. He presses a button to connect the voice of the speaker with the thousands outside. One night not so long past a speaker delivered a splendid address filled with solemnity and modesty. At the conclusion he glanced at the operator and, thinking the attendant had cut off the transmitter, said: "Much applause!" All Virginia heard his words!

Songsters Demand Pay.

Radio broadcasting faces another problem. Those fellows who have their offices along "Tin Can Alley" and write songs about the shores of Hawaii, the Sunny South, etc., have put in a bid for royalties on all broadcasting of their music. The Tin Can Alleyites, as the music publishers' center is commonly alluded to, claim that their songs are now heard by audiences of a million or more and want some payment for their use under arrangements similar to that which they have with phonograph record producers.

Great Trade Increase.

One manufacturer of standard radio parts reports an increase of production of 60,000 per cent this year over last. Another manufacturer, who, in 1920, sold 40,00 vacuum tubes, has sold 200,000 during the month of March, 1922.

SHIP-TO-SHORE SPEECH LATEST RADIO MARVEL

Engineers Perfect Scheme Whereby Ordinary Conversation, Just as Now in Use Over Telephone, Is Made Possible by Radio.

Ship-to-shore telephony has arrived. Practical examples of the tremendous value of the achievement were given recently when newspaper reporters, 370 miles at sea on the liner America, received assignments and telephone stories to their offices in New York City. During the same demonstration, H. B. Thayer, head of the Bell System, talked over his ordinary home telephone at New Canaan, Conn., to Captain Willima Rind, aboard the America.

At the instance of the telephone engineers, it was made possible for the newspaper men to talk from the ship by radio telephone. Their words were received at a radio station ashore and relayed over the regular land wires.

A brief paragraph dictated by a reporter aboard the America to another reporter in a New York newspaper office was the first newspaper dispatch ever transmitted from ship to shore by radio telephone. It told of the return of several American volunteers who had fought with the Spaniards against the Moors, and the man who received it was one of the number of newspaper men who had been invited to listen in on a test of the possibilities of supplementing the ordinary telephone wire service with radio service to ships at sea.

Reporter Gets Assignment.

A correspondent of the United Press who was returning to the States aboard the liner received an assignment to interview a nobleman aboard the ship. The news manager of the press service gave the assignment over his desk telephone in a New York office.

The transmission of the news dispatch, as well as the other conversations that made up the demonstration, was a complete success, but it could hardly be called an "exclusive story." Thousands of radio fans listened to the conversations, and for several days the radio station of the telephone company was flooded with letters from amateurs who reported having "picked up" the messages.

So long as the conversations were confined to the wires they were as secret as any telephone message, but the moment they began to leap through ether by means of the radio waves, they became the property of every receiving set owner within hundreds of miles.

Shortcomings Brought Out.

Other shortcomings of ship-to-shore communication were brought out. At various intervals intelligible communications with the ship was prevented by interference from spark stations, and the elimination of such intereference is one of the problems still awaiting solution. Another difficult problem is the transmission of a fixed current over telephone lines in spite of the variability of the radio signals to be relayed to these lines. "Static" still is troublesome, particularly in the summer when at times it obliterates the strongest radio signals.

The offering of commercial ship-to-shore service will involve the building of coastal radio telephone stations at suitable points for communication with ships at sea. It also will involve extension of the present nation-wide telephone lines relaying messages from the wires to the ether and vice versa. This composite system will enable a passenger on shipboard to talk with any one throughout the entire telephone system.

Program for Today

Daily radio program will be carride each morning in The Times-Dispatch.

EASTERN STANDARD TIME.

KDKA.

(East Pittsburgh).

10 A. M.—Services of the Emory Methodist Episcopal Church, Pittsburgh, Pa., Rev. W. Wofford T. Duncan, minister.

1:45 P. M.—Children's Bible Story, "The Story the Angel Told."

2 P. M.—Radio chapel at Westinghouse Station KDKA, conducted by Lieutenant-Colonel Thomas Stanyon, of the Salvation Ary, Pittsburgh, Pa.

8:30 P. M.—Services of Calvary Episcopal Church, Shady Avenue, Pittsburgh, Pa., Rev. E. J. Van Etten, rector.

DAYLIGHT SAVING TIME.

WJZ.

(Newark, N. J.)

3 P. M.—Salvation Army services conducted by Captain J. Allan, former senior chaplain of the Seventy-seventh Division, A. E. F. Sacred music by the National Staff Band, a quartet of vocalists and instrumentalists.

4 P. M.—Recital by William Versteeg, violin cello.

5 P. M.—Literary Vespers. "The Need for Tolerence," by Edgar White Burrill.

6:30 P. M.—Readings and records from the "Bubble Books That Sing."

6:45 P. M.—"Sandman Stories."

7 P. M.—Children stories.

7:30 P. M.—"Some Facts That Everybody Should Know About Tea."

8 P. M.—Recital by Alice Mengel, Russian pianist.

9 P. M.—Concert by the Princeton Alumni Association of the Oranges.

WHZ.

(Springfield, Mass.)

8 P. M.—Rev. Garret V. Stryker, secretary American-International College. Musical program by student chorus from college.

KYW.

(Chicago, Ill.)

3:30 P. M.—Radio chapel services, conducted by Rev. Gardner A. MacWhorter, of the Saint Edmund's Episcopal Church, on "The Voice of God." The music will be rendered by the quartet of Saint Edmund's Episcopal Church.

BUY "VARIOMETERS" INSTEAD OF "CORN"

CHICAGO, Ill., June 3.—Back in the pre-Sahara days it was with considerable difficulty sometimes that "paw" put one over on "maw" by slipping out of the rear door and sneaking over to the corner for a "high one." Nowadays he walks out of the front door and traverses the same path to the corner without a word of reproach from "maw."

The secret is that his favorite grog shop has been changed to a radio-supply station. Owing to the demand for radio supplies by devotees of the "new craze" radio supply and repair shops have sprung up in all parts of the city. According to Special Assistant Attorney-General C. W. Middlekauf proprietors of many saloons closed by permanent injunctions for violation of the prohibition law have obtained permission to open their establishments as radio supply stations.

"They did a thriving business in the old days," he said, "but with radio enthusiasts keyed to the pitch they are doing a business just as thriving today."

? Queries ?

W. H. H.—Would a loose-coupled receiver of the crystal type work to broadcast at a distance of ten miles? Answer: Yes, it should cover this distance.

E. F. G.—Could I enamel my own wire? Answer: This cannot be conveniently done.

V. M.—What will a beginner's set cost? Answer: Sets are advertised from $12.50 up.

T. N. F.—How can I overcome the induction from high tension wires, moving-picture feeders, etc.? Answer: A very careful shielding of your set will help a little. You should also take care that the aerial is exactly, or as nearly so as possible, at right angles to the wires. The problem is one of extreme difficulty and not easily overcome.

G. B.—I want to tap a coil to have a range of 150 to 3,500 meters with variable condenser. How should this be done? Answer: Tap a 300 turn coil every twenty turns with possibly a few short turns at the end.

F. C. L.—What are "test curves" as applied to radio? Answer: This might mean any graph or curve used to show the performance or characteristics of an instrument or device under test.

B. M. E.—Can staggered-wound coils be used without a variable condenser? Answer: Not satisfactorily. It might be well to try to tune with variometers.

R. K. H.—I reverse my "A" battery leads I do not get the signals as well. Why is this? Answer: This changes the potential on the grid of the amplifier tubes from negative to positive and destroys the amplifying characteristics of the tube by altering the working point on the characteristic curve.

R. I. H. I.—I am having trouble from the transformers of my amplifiers howling. What might remedy this? Answer: On each transformer the outside wire of the primary winding should go to "plate" and the outside terminal of the secondary should go to "grid." The accidental reversal of one or the other of these windings or both causes closer relationship capacitatively between grid and plate and causes squealing. This may be your trouble.

G. E. B.—I have a loose coupler and only hear signals when the aerial and ground are connected to the secondary instead of the primary. Just why is this? Answer: Unless a variable condenser is used the loose coupler is not a very efficient tuner. The variable should go across the secondary. Without varisble, use all the secondary turns and very close coupling.

S. C. R.—Will an antenna inside a room work? Answer: Yes. However, not as well as the outdoor aerial.

More Stations in U. S.

The supremacy of America in radio service will be appreciated, writes Commander Stanford C. Hooper, U. S. N., in Radio Broadcast, when it is understood that it has required more than twenty years of patient study, investigation, experienc and trial to develop the radio art to its present stag, where not only communications between ships and shore can be reliably carried on, but where transoceanic communications can be carried on in active competition with ocean cable systems.

When it is understood further that there are now ten high-powered radio stations in daily operation in the United States, five of the Radio Corporation of America and five naval, and seven similar stations in daily operation in our outlying possessions, one gets the picture.

These stations are capable of spanning the Atlantic and Pacific oceans, the Gulf of Mexico, the Caribbean Sea, the Gulf of Alaska, the Bering Sea and reaching out into the Mediterranean, Black and Red Seas, the Indian Ocean and Asiatic waters.

The effective transmitting range of each of these stations is from 3,000 to 6,000 miles, and as the stations are located along the coasts of the Atlantic and Pacific, in the West Indies, in the Canal Zone, in Hawaii, Guam and the Philippines it is obvious that their effective transmitting ranges cover the entire globe.

In addition to these there are approximately 200 medium powered stations having ranges of from 2,500 to 500 miles.

CANADA HAS MANY RADIO ENTHUSIASTS

WINDSOR, ONT., June 3.—Radio fans in the Windsor district now number several thousand, according to figures compiled by Sergeant A. Hirtenstein, of the Royal Canadian Mounted Police. He is responsible to the Dominion government for the collection of license fees for amateur experimental radio sets.

More than 500 applications for licenses have been sent to Ottawa by border residents. Some of these applications, the sergeant said, have been returned because the necessary $1 was not included.

Collection of license fees is difficult, because many of the receiving sets owned along the border are operated without aerials. Only a house-to-house investigation will determine the exact number of radiophone owners, Sergeant Birtwhistle said.

Applicants for licenses are required to get in touch with the Dominion naval service at Ottawa. Prosecutions will follow unless applications are filed within ten days of the sets being installed.

GOVERNMENT GIVES AID IN CIRCULARS

Amateurs may now construct a satisfactory two-circuit receiving set with variable coupler, at home on the kitchen table for a little over $15, according to a recent statement from the Bureau of Standards of the Department of Commerce. This set will have a much greater selectivity than the single-circuit set described and illustrated in the Bureau of Standards circular 126, which can be secured from the superintendent of public documents for 5 cents.

The new circular describes the construction and operation of this two-circuit set with illustration, and also gives a list of the parts needed, the cost of making a complete set being between $15.20 and $22.20. If you built the set described in the first Bureau of Standards circular, you can use most of that material and complete the two-circuit set at an additional cost of from $4.65 to $7.85, the chief item being the variable condenser.

This second publication, "Construction and Operation of a Two-Circuit Receiving Equipment With Crystal Detector," Bureau of Standards circular No. 121, will be sold for 5 cents a copy by the superintendent of public documents, Government Printing Office, Washington, D. C., but probably not before the middle of June.

British Columbia Set.

The province of British Columbia has established a transmitting set with a radius of some 2,500 to 3,000 miles. Ships that distance at sea have been in communication with the station which broadcasts a program of music, health talks, weather reports and educational matter on a regular schedule.

SOME HIGH SPOTS IN THIS WEEK'S RADIO PROGRAM FROM STATION WBAZ

Dispatch Papers' radio broadcast is transmitted from 7:45 o'clock on in the evenings. The wave length is 260 meters and the range, according to reports already received, 300 miles, daylight.

MONDAY: Address by George H. Ware, of the Virginia Auto Supply Company and designer of the Dispatch Broadcast Station, on "Radio—Its Possibilities."

TUESDAY: Virginia entertainers and Senor Jose Andonegui in violin selections.

WEDNESDAY: George W. Koiner, Commissioner of Agriculture.

THURSDAY: Double quartet through courtesy of Miss Jean Trigg, and special soles.

FRIDAY: Lorillard Colored Chorus.

SATURDAY: Frank G. Louthan, of the Kiwanis Club, speaker, and Federal Reserve Bank Night; program, by bank employes, arranged by C. W. Moss.

Other features will be added during the week.